

IN THE CLAIMS

8. (Amended) A system for improving performance in chemical mechanical polishing (CMP) application, comprising:

a wafer head capable of carrying a wafer;

*A*  
a polishing belt disposed below the wafer head; and

a platen having piezoelectric elements positioned below the polishing belt, wherein the piezoelectric elements are capable of exerting force on the polishing belt.

*A2*  
15. (Amended) A system as recited in claim 8, further comprising a sacrificial material disposed above the platen, the sacrificial material being used to reduce wear on the platen.

REMARKS

Claims 1-28 are pending in the application. Claim 8 has been amended for clarification purposes. Claim 15 has been corrected to depend on independent claim 8. In addition, the Cross-Reference section has been amended to provide the application numbers of the related applications.

Claims 1-7 were rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 5,888,120 to Doran. Applicants respectfully traverse. As will be fully explained below, Doran does not disclose or reasonably suggest each and every element of the invention as claimed by Applicants.

Independent claim 1 requires a platen comprising a plurality of piezoelectric elements disposed above the platen, wherein the plurality of piezoelectric elements is capable of exerting

force on a polishing belt. In sharp contrast, Doran discloses a wafer carrier having a plurality of piezoelectric elements that exert force on a substrate. See Doran, Fig. 3, col. 4, lines 8-50. Doran does not disclose or reasonably suggest a platen having piezoelectric elements that are capable of exerting force on a polishing belt. Unlike the Doran carrier, which risks damaging the wafer when bending the wafer substrate, embodiments of the present invention do not risk damaging the wafer via substrate bending. More particularly, embodiments of the present invention exert force on a flexible polishing belt to shape the belt, rather than the wafer, to improve performance during the CMP process.

Accordingly, independent claim 1 is submitted to be patentable under 35 U.S.C. § 102(b) over the Doran patent. Claims 2-7, each of which ultimately depends from independent claim 1, are likewise submitted to be patentable under U.S.C. § 102(b) over the Doran patent for at least the same reasons set forth above regarding independent claim 1.

Claims 8-14, 17, 19-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,916,012 to Pant et al. (Pant) in view of U.S. Patent No. 5,888,120 to Doran. As will be fully explained below, the combination of the Pant and Doran references does not establish a *prima facie* case of obviousness against the subject matter defined in claims 8-14, 17, 19-23.

Each of the claim elements is addressed separately below, but in general unsupported assertions of what those skilled in art might have done do not provide a level of support which meets the Office's burden of proof. Of course, those skilled in the art *could* have tried to accomplish much had they had the perspectives of and the benefit of hindsight from the present inventors. With the hindsight of these perspectives, they might have even tried to achieve the present invention – but as the art of record poignantly shows, they did not.

In spite of attempts by those skilled in the art to address the problems solved by the present invention, until the present invention, those problems were not solved in the manners claimed. To a large degree, the references cited actually show the exact opposite – that the understanding of those skilled in the art at the time the invention was made did not include the perspective which the present inventors had. To say that those of ordinary skill could have achieved the various claimed elements and combinations is not only unsupported, but it begs the question. Of course, once traversed, it is improper to maintain an unsupported allegation.

Perhaps the most evident example that the aspects are not, in fact, obvious relates to the element of “a platen having piezoelectric elements positioned below the polishing belt, wherein the piezoelectric elements are capable of exerting force on the polishing belt,” as recited in independent claim 8.

As mentioned previously, Doran discloses a wafer carrier having piezoelectric elements that exert force on the substrate. See Doran, Fig. 3, col. 4, lines 8-50. Doran does not disclose or reasonably suggest a platen having piezoelectric elements that are capable of exerting force on a polishing belt. Pant discloses a platen that utilizes air to exert pressure below the polishing belt, but, as the Examiner has noted, Pant does not disclose the use of piezoelectric elements for exerting pressure on the polishing belt.

Indeed, neither the Pant reference nor the Doran reference discloses a platen having piezoelectric elements. Further, the combination of the Pant and Doran references does not achieve the claimed invention. As stated above, The Pant reference discloses a platen that utilizes air to exert pressure below the polishing belt. However, as stated in the present application, the piezoelectric elements of a platen of the embodiments of the present invention greatly reduce the amount of air needed during the CMP process. Page 6, lines 1-3. Moreover, a CMP process using the piezoelectric elements of the present invention is not as sensitive to

conditions as conventional CMP processes utilizing air bearings, such as the Pant reference. Unlike air bearings, the force exerted by the piezoelectric elements of the embodiments of the present invention does not experience as great a variance as experienced by air bearings when the gap between the polishing pad and the platen varies. Thus, if the polishing pad is pushed toward the platen in one area, the force exerted on the polishing belt by other piezoelectric elements is not as affected as other areas would be when utilizing an air bearing. Page 6, lines 4-11.

Doran also does not teach utilizing piezoelectric elements on the platen to flex the polishing belt. As mentioned above, Doran discloses a wafer carrier having piezoelectric elements that exert force on the substrate, which risks damaging the wafer when bending the wafer substrate. Unlike Doran, embodiments of the present invention do not risk damaging the wafer via substrate bending. Instead, embodiments of the present invention exert force on a flexible polishing belt to shape the belt, rather than the wafer, to improve performance during the CMP process. Hence, combining the Doran Reference with the Pant reference provides a linear polishing system that utilizes an air bearing in conjunction with a wafer carrier that flexes the wafer substrate in an attempt to improve edge performance, which is not what is claimed.

Accordingly, independent claim 8 is submitted to be patentable under 35 U.S.C. § 103(a) over the Pant patent in view of the Doran patent. Claims 9-16, each of which ultimately depends from independent claim 8, are likewise submitted to be patentable under U.S.C. § 103(a) over the Pant patent in view of the Doran patent for at least the same reasons set forth above regarding independent claim 8.

Independent claims 17, 21, 24, and 27 are submitted to be patentable under 35 U.S.C. § 103(a) over Pant in view of Doran and Tietz for at least the same reasons as set forth above with respect to independent claims 1 and 8. Claims 18-20, 22-23, 25-26, and 28, each of which ultimately depends from independent claim 17, 21, 24, and 27, respectively, are likewise

submitted to be patentable under U.S.C. § 103(a) over Pant in view of Doran and Tietz for at least the same reasons set forth above regarding independent claim 1 and 8.

In view of the foregoing, Applicants respectfully request reconsideration and reexamination of claims 1-28, and submit that these claims are in condition for allowance. Accordingly, a notice of allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at **(408) 749-6900 x6920**. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-0805 (Order No. LAM2P220C). A copy of the transmittal is enclosed for this purpose.

Respectfully submitted,  
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Application No. 09/747,844

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of

Kistler et al.

Application No. 09/747,844

Filed: December 12, 2001

For: PIEZOELECTRIC PLATEN DESIGN FOR  
IMPROVING PERFORMANCE IN CMP  
APPLICATIONS

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**MARKED UP CLAIMS**

8. (Amended) A system for improving performance in chemical mechanical polishing (CMP) application, comprising:

a wafer head capable of carrying a wafer;

a polishing belt disposed below the wafer head; and

a platen having [a] piezoelectric elements positioned below the polishing belt, wherein the piezoelectric elements are capable of exerting force on the polishing belt.

15. (Amended) A system as recited in claim [1] 8, further comprising a sacrificial material disposed above the platen, the sacrificial material being used to reduce wear on the platen.